

ABSTRACT

A METHOD OF ESTIMATING THE CARRIER FREQUENCY OF A PHASE-MODULATED SIGNAL

A method of estimating the carrier frequency of a phase-modulated signal involves a) extracting the pulse train from the signal, b) making an initial estimate of the carrier frequency, c) estimating the error in the initial estimate, d) using this error to generate a more accurate estimate of the carrier frequency, and repeating steps c) and d) until a sufficiently accurate estimate of the carrier frequency is obtained. Step c can involve extracting the phase information in the signal, mixing the signal down to 0 Hz by removing the initial estimate of the carrier frequency to give complex IQ data, calculating the phase of the signal as a function of time, calculating the mean phase, wrapping the data into a phase range equal to the size of the phase jump, and calculating the error in the initial estimate of the carrier frequency from the gradient of this graph.